The Excavating Engineer

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New York Trap Rock Corporation's Quarry at Verplanck's Point

Description of the Operations at One of This Company's Three Quarries, Which Ship About Nine Thousand Cubic Yards of Rock per Day by Barge to New York and New Jersey

FORTY miles up the Hudson River from New York City lies the Verplanck's Point Quarry of The New York Trap Rock Corporation. This quarry, with an output of about twenty-six hundred cubic yards per day, is but one of the three operated by this company, which have, combined, a daily output of about nine thousand cubic yards. Although there is some shipment by motor truck, the main part of the rock shipped from this company's quarries is shipped by barge, on the Hudson River, to points in New York and New Jersey.

The Verplanck's Point Quarry covers an area of about seven acres, and up to the present time has been worked to an average depth of ninety feet. The ultimate depth of the quarry floor will probably be one hundred and eighty feet. The rock is an excellent grade of limestone, and is remarkably free from seams.

Modern and Efficient Equipment

The plant is made up of the most modern equipment throughout. The crushing and screening plant is driven by electricity, and the Woodford Electric Haulage System materially reduces the personnel required for operation. For a number of years this company has used the small revolving shovel for loading its material. The whorley has been used instead of the railroad-type shovel, because the management has found from experience that the railroad-type shovel lacked the mobility that their work required. Of course, the small revolving shovels — not really intended for this class of digging — required more repairs than would railroad-type shovels on the same heavy work, but this additional maintenance cost was more than offset by the advantages of the whorley.

A Four-Yard Full-Revolving Shovel Installed

Last fall the company installed a four-yard full-revolving shovel, built specifically for mine and quarry work. This shovel, a Bucyrus 120-B, is equipped with a four-yard dipper, 29½-foot boom and 20-foot dipper sticks, is mounted on single-truck caterpillars, is electrically driven, and combines all the advantages of the small revolving shovel with the great strength and power of the old standard railroad-type shovel.

This shovel, operating ten hours per day, is at present loading out an average of twenty-six hundred cubic yards of rock per day. Plans for reorganizing the haulage system are under way, and it is expected that during the coming season the daily output will reach thirty-seven hundred cubic yards.

(Courtesy Robins Conveying Belt Company.)

One End of Screening Station

The Woodford Haulage System

Cars are handled in the quarry by the Woodford Electric Haulage System. They are of ten cubic yards capacity, and are each electrically driven by individual motors, drawing power from a third rail in the track system. The quarry track is divided into sections, so that, except when being spotted, each car is under the control of the operator located in a central control tower. Empty cars under control from the operating

tower are brought to a point near the shovel where they are handled by one of the pit men of the shovel crew. After loading, the cars are started by the pit man, and as they leave the shovel they come again under the control of the man in the operating tower, who guides them to the crusher, dumps them and runs them back to the shovel again. The tower operator has control of all

(Courtesy Burrell Engineering & Construction Co.)
The barge-loading conveyor belts in action. This equipment is capable of loading a barge of 1,000 tons capacity in one hour.

switches in the quarry, and so can send cars to any point on the track system. Electric current at two hundred and fifty volts is used for propelling the cars, one hundred and fifty volts is used for breaking. The cars were built for the Woodford Engineering Company by the Western Wheeled Scraper Company and are driven by thirty-seven horsepower motors.

The Crushing and Screening Plant

The primary crusher is located just below the quarry flood level, so that the material is brought to it without going up an incline. This first crusher is a 48-inch x 60-inch Traylor Bulldog Jaw Crusher. The cars are dumped into the hopper of this machine by the tower operator.

From here the rock is carried by a 42-inch seven-ply conveyor belt with a $\frac{3}{16}$-inch rubber cover to the next crusher, which is a No. 10 Kennedy, to which will be added this winter a new 20-inch crusher.

The secondary crushers comprise four Allis-Chalmers No. 6 crushers in operation at the present time and 72-inch x 30-inch finishing rolls which are now on the ground, and will be installed some time this winter.

One and one-half-inch stone is screened with Robins cataract grizzly screens, and one and one-quarter-inch and three-quarter-inch stone is screened with Robins Bronco shaking screens. This winter will see the installation of Robins vibrating screens for the screening of five-eighths and three-eighths-inch stone. This will give the plant equipment to ship $\frac{3}{8}$-inch, $\frac{5}{8}$-inch, $\frac{3}{4}$-inch, $1\frac{1}{4}$-inch and $1\frac{1}{2}$-inch stone.

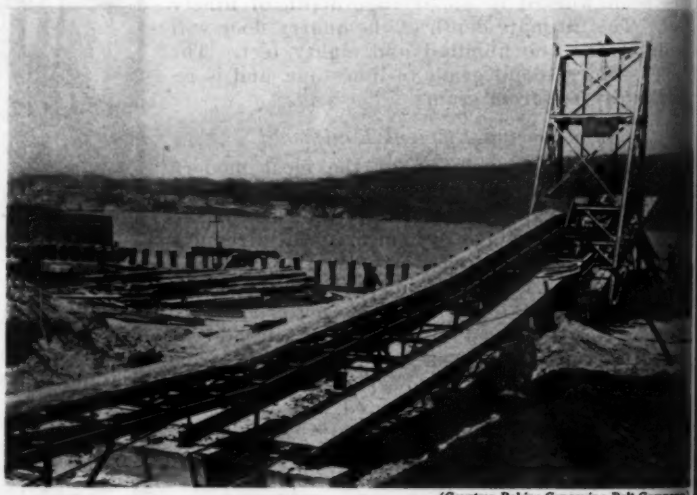
The completed product is carried by conveyor belts to storage piles, which have a capacity of about 10,000 cubic yards.

Equipped to Load a 1,000-Ton Barge in One Hour

Conveyor belts running in tunnels under the storage piles are arranged for reclaiming any size or combination of sizes which may be required. These conveyor belts, running to the river's edge, are so arranged that a 1,000-ton barge may be completely loaded in an hour.

About 1,000 cubic yards a day is shipped by motor truck. This material is taken from the storage piles by conveyor belts as for loading the barges.

The entire plant is driven by electric motors. The power is purchased from the Northern West Chester Power Company, and is generated by either the New York Edison or the United Electric Company. The transmission line brings current to the company's property at a pressure of 13,200 volts, where six single-phase transformers with a total capacity of 3700 KVA step the current down to both 2300 volts and 440 volts. All motors in the plant of over 25 horsepower are operated from the 2300-volt lines, while all motors under 25 horsepower are operated from the 440-volt line. Bad weather conditions at this plant



(Courtesy Robins Conveying Belt Company)
Looking Up the 42-inch Conveyor Leading to the Screens

make electric drive very much to the company's advantage.

Formerly at this quarry there were used four shovels: a Bucyrus 20-B for stripping, and a Bucyrus 35-B, a Bucyrus 50-B, and a Marion 37 for loading.

The Bucyrus 120-B will now do all the loading. The Bucyrus 20-B will still be used for stripping, while the Bucyrus 50-B will remain on the job as an auxiliary unit.

Mr. Kelleher is superintendent of this quarry. The 4-yard shovel is operated by Mr. Lewis.

(*Courtesy Robins Conveying Belt Company.*)

The barge-loading equipment. The conveyor to the right leads from the storage to the boom conveyor. It is 36 inches wide, made up of seven-ply 36-ounce duck, with a 3/16-inch top cover and a 1/16-inch back cover of rubber. The conveyor on the left is mounted on an adjustable boom.

Two Other Quarries with Capacity of 6,000 Yards

The New York Trap Rock Corporation also operates a quarry at Clinton Point in which the rock is dug by two Bucyrus 50-B's, one Bucyrus 110-C railroad shovel, one Class-45 Atlantic railroad-type shovel and one Bucyrus 103-C railroad-type shovel. The material is handled from the shovels by about fifty 8-yard cars, for which the motive power is eight 25-ton saddle-tank dinkey locomotives. The crushers comprise one No. 21

Looking across the quarry floor at Verplanck's Point. The 4-yard shovel in the foreground is loading into 10-yard cars handled by the Woodford Electric Haulage System. The shovel on the right is used as an auxiliary.

Allis-Chalmers crusher, two No. 8's and six No. 6's of the same make.

At Cedar Cliff a third quarry is operated by the company, where the equipment is, in brief, three Bucyrus 50-B shovels, about forty 5-yard cars, six Whitcomb gasoline locomotives, one 48-inch x 60-inch Bulldog Jaw Crusher, one No. 8 Traylor, one No. 9 and four No. 6 Allis-Chalmers crushers and four No. 8 Traylor crushers.

The main offices of the New York Trap Rock Corporation are at 110 Park Avenue, New York. N. D. Lancaster is president; M. D. Wandell is vice-president; Wilson P. Foss is vice-president; R. T. Gent is general superintendent in charge of all three quarries.

The face of the Verplanck's Point Quarry. Some idea of the height may be judged by the size of the electric shovel; the shovel has a 29½-foot boom and 20-foot dipper sticks. Note the horses in the extreme right of the picture supporting the electric cables over the loading track.

The Thunder Maker of the Princess Pat

By Arnold Andrews

This is a tale that is often told
By the side of a pit bonfire,
While the shovels roar at their endless chore
To the dinkies who never tire.

Old John, he keep by himself batch;
Big Steve, he batch by him;
Pine stumps they like for wood to catch,
That there be old John's whim.

One day come thunder, rain like hell,
The lightning, he flash bright;
Old John, he say, "Pine stump be swell,
Too bad all gone tonight."

Big Steve, he say, "By gee, that's right,
I go get some right now;
I take four, five sticks galamite,
Blow up one stump, ze-wow."

Just then the thunder go "Boom-boom!"
"Ha ha," Big Steve, he say,
"God, He make thunder go boom-boom:
Me, I make thunder, hey?"

"More better thunder yet, I make —
More better'n God's, I bet."
God's thunder make the shack to shake
But Steve go out in wet.

By 'n' by old John hear one kerzam!
Big Steve his thunder make,
More better thunder 'n God's by damn —
Sure make the old camp shake.

By 'n' by Big Steve, he no come back,
Old John, he wonder why;
He look out toward the railroad track
When lightning he come by.

He look and look. Big Steve no come.
By 'n' by no come some more;
Old John, he start to worry some,
Get coat, go out the door.

He find the place where Big Steve shoot,
Pine stump be everywhere;
But though old John, he shout and hoot
He find no Big Steve there.

By 'n' by he find a piece of sleeve,
By 'n' by a hunk of skin,
And that was all was left of Steve
Who bet with God and win.

That is the way the tale is told
'Round the fires of the Princess Pat,
While the black smoke rolls from the glowing coals
And we gossip of this and that.

A Decidedly Slow-Speed Diesel Engine

We have had the following clipping from another paper called to our attention. It must be admitted that the speed is decidedly conservative.

"The Bucyrus Company displayed their new Type 20-B shovel equipped with the Atlas-Imperial full Diesel engine. The engine was especially designed for this machine, and is a 45 h. p. mechanical injection, 4-cycle, 3-cylinder, slow-speed, heavy-duty 7-inch x 10-inch engine, running at the conservative speed of 425 revolutions per month."

The B. E. L. Coal Company's 50-B shovel at work in hard blue shale. The man in the foreground is Garry Block, one of the members of the firm.

1¾-Yard Shovel Stripping Coal

Operations of the B. E. L. Coal Company's Small Open Cut Mine Near Bronaugh, Missouri, on the Missouri Pacific Railroad

ABOUT one hundred miles due south of Kansas City, just a few miles east of the Kansas-Missouri border, lies the little town of Bronaugh, Missouri. Just outside the limits of this town, the B. E. L. Coal Company operate a stripping property. The operation of this property is decidedly out of the ordinary, in that the stripping is being handled by a 1¾-yard steam shovel.

The area of the property underlaid with coal is about 160 acres in extent, of which less than thirty acres has been worked over at the present time. The property is "L" shaped, and has a small pond near the point where the two parts of the "L" intersect. The topography is such that the stripping is self-draining. The coal lies in a uniform vein, about 13 inches thick, and has a heat value of about 13,760 B. T. U. The overburden runs from 6 to 15 feet in depth, of which the part lying directly over the coal, to a depth of three to eight feet, is a hard blue shale.

To strip this vein of coal the B. E. L. Coal Company purchased a Bucyrus 50-B steam shovel, mounted on caterpillars. This machine works one ten-hour shift per day, and uncovers about one hundred tons of coal. When the machine was first nosed into the cut, it handled the shale without any previous breaking. It was found, however, that by blasting they could double the yardage. Holes are drilled about 30 feet apart, and each one loaded with one to two kegs of Atlas black powder. The holes are drilled by a churn drill, driven by a Fordson tractor, which is also used to move the drill about.

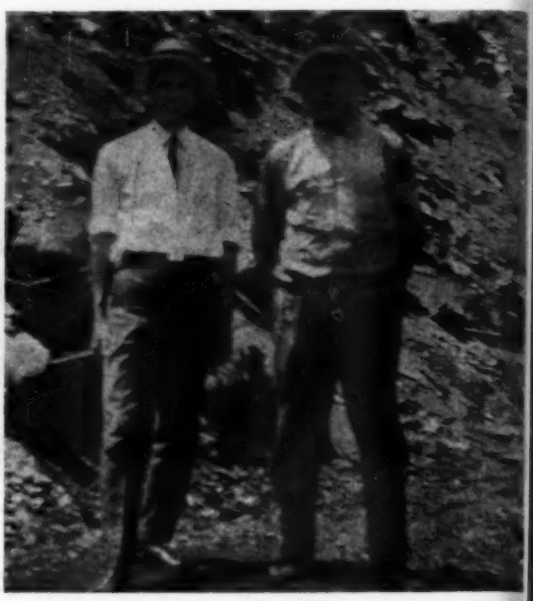
The coal is pinned off on a long tapering face, and loaded by hand into wagons which haul it to Bronaugh where it is loaded into railroad cars. Eight wagons serve the shovel. By this method

1¾-yard shovel in a box cut, stripping coal. The overburden is 14 feet in depth, the width of the cut is 31 feet.

of breaking and loading coal, two distinct advantages are gained. First, since the method of pinning breaks up the coal much less than by blasting and loading with a shovel, the recovery of lump is very high — in fact about 75 per cent. Second, because of the hand grading of the coal in the pit, they are able to do away with the need for a tipple. The figure given above for daily output is 100 tons a day. It certainly speaks well for the efficiency of the management that during the second month of operation 2,700 tons of coal were loaded out, with the plant working on a single shift. Only about twenty-five per cent of the output is shipped as mine run.

Water is supplied to the boiler of the shovel by a 2-inch by 1½-inch pump driven by a Witte gas engine. Incidentally, this is the only pumping outfit required on the job, as the property is self-draining. Water is pumped to a tank, and fed to the boiler by gravity.

The B. E. L. Coal Company is a co-partnership of the following men: Mr. G. Block, superintendent of the work; Mr. A. C. Ellsworth, who is responsible for the sale of the coal; and Mr. Warren Little, who runs the shovel. The company maintains offices at both Bronaugh and Pittsburg, Kansas. The mine employs about ten to twelve men.



Left to Right, Sales Manager Jones and Warren Little, Who Is a Member of the Firm and Who Operates the Shovel.

Quarrying Rock for Dams on the Mississippi River

Description of the Operation of the United States Engineers Stone Quarry at Montpelier, Iowa, Supplying Rock for Dams and Rip-Rap Protection Along the Northern Part of the River

THE ghostly timbers of the Robert E. Lee and the Natchez would probably shiver in their muddy graves, if they could see the changes that have taken place along the Mississippi River since they ploughed furrows in its waters.

Today one sees, in addition to the old stern wheeler, the ugly, oil-burning, screw-propelled power boats of the federal barge line. Instead of the picturesque crews of stevedores and deckhands, which used to put song and color into the landings along the river, one finds great concrete wharf-barges or permanent docks equipped with cranes and tracks; and along the river bank, still other changes are found, here a dam and here a dike. The river has been changed from a drainage ditch to a great highway. Over 2,700 dikes have been built, and over 550 separate shore works and projects completed by the government.

A fair proportion of these aids to navigation have been on that part of the river lying between the mouth of the Missouri River and St. Paul, Minnesota. In this district the work is similar to that elsewhere on the river. Dikes are built to close side chutes and contract the medium flow of the stream without materially affecting the high water flow. The construction of a series of dams from one bank usually makes it necessary to protect the opposite bank by similar work on rip-rap.

In the spring of 1924 the district engineer in charge of this section of the river opened a quarry at Montpelier, Iowa, to supply stone for the improvement work.

The quarry has an area of about three acres, the dimensions being 300 feet by 400 feet. The rock is a limestone formation; the top 14 feet has seams running through it about 4 feet apart, while below this level it is very solid and free from seams. Above this stone the overburden varied from three to six feet of black soil.

For the operation of this quarry the War Department purchased a Bucyrus 20-B revolving shovel, a steam-driven machine mounted on caterpillars and equipped with a ¾-cubic-yard dipper. This machine was first used to strip a portion of the quarry. For this purpose four one-ton Ford trucks served the shovel, dumping the material beyond the quarry limits, a haul of about five or six hundred feet.

The first cut was made with a 14-foot depth of face. The second cut brought the quarry floor

to a level 28 feet below the former ground surface. It will later be deepened to 56 feet.

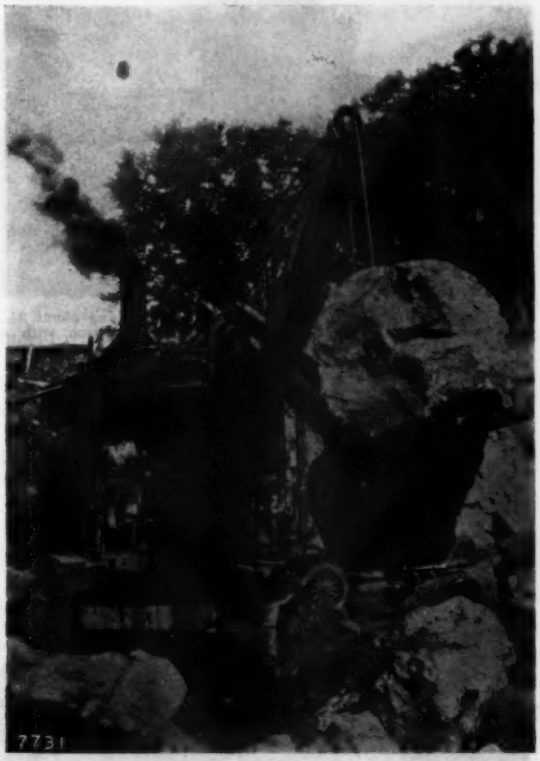
The rock is shot down by the use of 40% straight dynamite, which is detonated with electric caps and battery. Holes are drilled with one-inch steel, go to a depth of 14 feet and are spaced about 6 feet apart. In normal operation, about one shot every two weeks is set off. Each shot consists of about 75 to 100 holes and results in about 6,000 cubic yards of rock.

The drilling equipment is Ingersoll-Rand and consists of two D. C. R. W. 23's, three jackhamers and one X-70 wagon drill. Air for the operation of this equipment, as well as for a Leyner drill sharpener and a blacksmith's forge, is supplied by a large Ingersoll-Rand portable compressor.

The ¾-yard shovel in the midst of oversize rock, the result of a blast for which only a small amount of explosives was used in order to prevent damage to a nearby dwelling.

Although the blasted rock is usually well broken, the shovel encounters many pieces which are too large to load without injury to the trucks. These are overcast by the shovel and broken into pieces of suitable size by the jackhamers.

As mentioned above this stone is used for rip-rap protection, and the construction of dams along the Mississippi between Rock Island, Illinois and Burlington, Iowa. The material is handled on the river by twelve barges, towed in lots of from four to six between Montpelier, Iowa, the quarry location, and the construction work on the river. The distance varies, but runs as high as 60 miles. The towboat makes one trip



Rocks like the one shown above are not unusual on this job. As these rocks are too large to load into trucks they are overcast by the shovel and broken up with jackhamers.

each way every 24 hours except when stormy weather interferes.

The barges are loaded by four 1-ton Ford trucks equipped with dump bodies. These trucks are loaded by the shovel, and must drive on to the deck of the barge to dump their load. Since only one truck at a time can get on to a barge the shovel is often kept waiting. The haul by truck is from 800 to 1000 feet. Last season the quarry was operated one 8-hour shift a day from May 29th to June 18th; two 8-hour shifts per day from June 19th to July 28th; and three 8-hour shifts per day from July 29th to November 17th. The daily average for the entire season was 254 cubic yards of stone.

Several times during the operation of the quarry in the season of 1924 the shovel was run

The shovel handling an old steamboat boiler, weighing about 2½ tons, which was used as an air receiver in connection with a portable compressor.

up out of the pit and used for stripping. The caterpillar mounting made it possible to accomplish this with a minimum of lost time. This mounting also made it very easy to back away from blasts and avoid damage from flying rock. River water was used in the boiler without trouble, although when the river was muddied by heavy rains it was necessary to wash out once a week.

Thos. Whalen is quarry foreman, Billy Hawks, shovel operator, and Larry Crail, fireman. The work is under the District Engineer, United States Engineers' Office, Rock Island, Illinois.

We are indebted to Major B. C. Dunn for the information from which this article was written.

Steel Industry

It is interesting to note that the center of the steel industry in the United States is apparently shifting westward.

Fewer open-hearth and blast furnaces are being built east of the Ohio-Pennsylvania line than west of it.

A view of the United States Engineers Quarry at Montpelier, Iowa. The rock is loaded into one-ton Ford trucks and hauled to the barges on the Mississippi River.

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Federal Reclamation

During the agricultural year of 1924 the Bureau of Reclamation irrigated 1,290,890 acres of land covered by project census statistics. On the cropped area of 1,216,610 acres, crops were grown having a gross value of nearly $66,500,000, or $54.65 per acre cropped. Including the land furnished in whole or in part with water from the works of the Bureau, under the Warren Act, the gross value of crops produced in 1924 amounted to nearly $110,000,000.

The irrigation works operated by the Bureau included more than 100 storage and diversion dams; 15,800 miles of canals, ditches, and drains; 700 miles of pipe line; 150 miles of flume; and more than 141,000 structures incident to the carriage and distribution of the water.

During the past year of 1925 the Bureau continued the extension of the irrigation projects, including the construction of 500 miles of canals, ditches and drains; 6,000 canal structures; 485 bridges; 181,000 linear feet of pipe; and 8,360 linear feet of flume; and excavated 10,875,000 cubic yards of earth and rock, the total excavation at the end of the past year amounting to nearly 246,000,000 cubic yards.

The Bureau has completed the Tieton dam on the Yakima project, Washington, 244 feet high and impounding 202,500 acre-feet of water; the Black Canyon Dam, in Idaho, 183 feet high, diverting water from Payette River; and is constructing the McKay dam on the Umatilla project, Oregon, and the Guernsey Dam on the North Platte project, Nebraska-Wyoming.

The Bureau also initiated and completed investigations of a large number of possible irrigation projects to determine their economic feasibility, chief among which are the Kittitas division of the Yakima project in Washington; the Baker, Vale, and Owyhee projects in Oregon; the Spanish Springs extension of the Newlands project in Nevada; the Weber-Provo Division of the Salt Lake Basin project in Utah; and the Willwood Division of the Shoshone project, in Wyoming. A printed report covering these economic investigations has been issued and may be had by addressing *The United States Department of Interior, Bureau of Reclamation, Washington, D. C.*

Good Management

Good management depends on straight-line methods with no lost motion. It is well-defined organization; it is system. But often where the word system is mentioned the "crepe hanger" howls "red tape."

However, it has been proved conclusively that where inspection, lubrication, repairs and maintenance are carried out in a systematic manner a great deal of lost time during working hours may be avoided, to say nothing of the night work and overtime.

What is everybody's job is nobody's job, therefore the first requirement is a definitely established organization with an executive who will supervise and see that these requirements are carried out.

The operator must have full charge of the machine, and is responsible to the superintendent for its operation and upkeep.

The fireman must be entirely responsible for the boiler and the lubrication and care of machinery and engines on the car.

On larger shovels the cranesman should be held responsible for the lubrication and the care of the boom and all parts attached thereto, including the hoisting chain on railroad-type shovels. When moving up his place is on the ground watching the wheels and, in the absence of a pit foreman, superintending the trucks and jacks and signalling the operator.

The operator should see that his men are equipped with the tools and supplies necessary to carry out their part of the work, and if he looks over the machine at least once a day, to see that each man is on the job, it will not be long before results will be acquired which cannot be attained in any other way.

At his home in West Orange, New Jersey, Thomas A. Gillespie passed away on January 28th.

Mr. Gillespie was chairman of the board of the T. A. Gillespie Company, general contractors of New York City. He was also director of the Equitable Life Insurance Society and served other corporations. Born in Pittsburgh, Mr. Gillespie was for some years associated with the late George Westinghouse in the development of the natural gas industry. There he and his company formed the T. A. Gillespie Company in 1897, handling railroad and other construction work.

32303

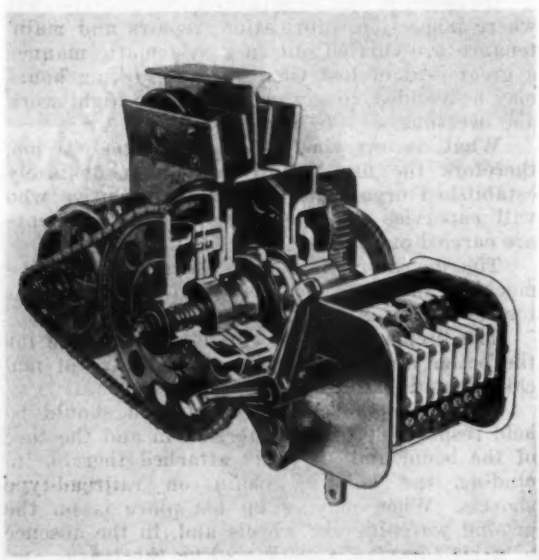
DEVICES YOU OUGHT TO KNOW ABOUT

Yale Model 20-B Ball-Bearing Electric Chain Hoist

The Yale & Towne Mfg. Co. of Stamford, Connecticut, has recently developed a new ball-bearing electric chain hoist known as Model 20-B.

The Yale Model 20-B can be quickly adapted to any overhead system. The side plates of the trolley carriage can be spaced on steel bars to fit the desired beam flange.

Chain can be furnished for varying lengths of lift. The centralized steel suspension means a



constantly balanced load on the trolley wheels and hoisting unit, irrespective of load position.

The mechanism is fully enclosed in oil-tight chambers, and is compact and easily accessible for inspection without expert service. The ball-bearing load sheave adds a big factor for low current consumption and general all-around hoisting efficiency. For further information write the manufacturer.

New 4-Ton Gasoline Locomotive

A new 4-ton gasoline locomotive incorporating the Fordson engine and transmission parts was recently announced by the *Davenport Locomotive Works, Davenport, Iowa.*

It is said that the design of the locomotive is very simple and accessible, and the rugged, balanced construction found in the larger Davenports has been duplicated.

The design is flexible, allowing the use of a canopy cab, a fully-enclosed steel cab, or the removal of the cab altogether. The operating levers are placed within easy reach at the right-hand side of the cab, and clear vision is provided in all directions.

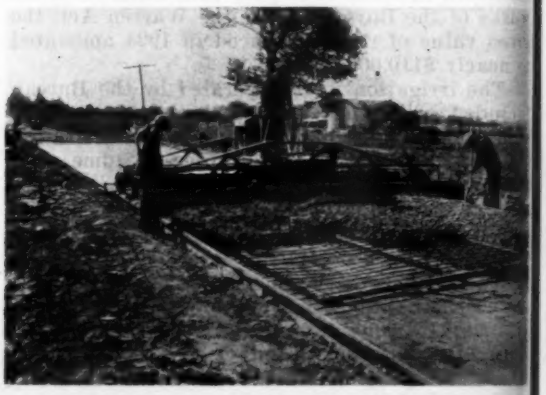
The locomotive has a speed range of 3 to 14 miles per hour, and a maximum tractive power of 2125 pounds. Its operation is highly economical, starting on gasoline and running on kerosene.

This 4-ton locomotive completes the Davenport line of 4 to 20-ton gasoline locomotives.

New Model Type "C" Lakewood Road-Finishing Machine

The Lakewood Engineering Company of Cleveland, Ohio, has recently developed a new Model Type "C" Lakewood road-finishing machine.

It is said that noteworthy improvements have been made which add very much to the life of the machine and to the satisfaction which it will give, and no effort has been spared in the mechanical construction to provide for long life and freedom from breakdowns on the job.



A stronger truss of channel frame construction is used, the central panel of which carries the complete transmission assembly. This central panel is identical for all widths of machines, so that to change the width it is simply necessary to bolt on the new extension side members of the proper width and put in place the other cross members, such as the screed and tamper.

New Road Device Perfected

A new device known as a "roughometer" has been perfected by the United States Bureau of Public Roads. It is attached to an automobile and determines the relative roughness of different sections of the road surface. The principle upon which it is based is different from that of any other instrument now in use for this purpose.

SHOTS FROM THE · FIRING LINE ·

Central States Notes

BY H. C. DAVIS AND J. C. YETTER

The Brooks Construction Company, near Lowes, Kentucky, on the Illinois Central Railroad Edgewood Cut-off, report that they are working a Bucyrus 50-B steam shovel. They started a 450,000-cubic-yard cut on February 16, 1925, and had it completed December 18, 1925. During this time the night shift worked from March 2 to December 4th. Pat Blaker was the operator, Robert Osborn, the fireman, and Charles Wells, the foreman.

The Louisville & Nashville Railway Co. are double tracking about 25 miles of track between Winchester, Kentucky, and Richmond, Kentucky. There will be three or four tunnels to widen, and one bridge across the Kentucky River to erect. Mr. B. O. Boxler of Orange, Virginia, is the contractor doing this work, but part of it is being done by the Louisville & Nashville. This work will be completed in the early part of 1927.

A. F. Hartigan, Lowes, Kentucky, has just completed a 150,000-cubic-yard cut on the Illinois Central Edgewood Cut-off. A Bucyrus 50-B steam shovel was used. Fred A. Rouse was the operator, L. O. Flynn, the fireman, Franklin Gleen, the superintendent, and Robert Brooks, the foreman.

Foley Bros., St. Paul, Minnesota, have been awarded two large railroad construction contracts in Florida by the Seaboard Air Line.

The M. A. Hanna Company have recently placed orders for two Bucyrus 120-B electric shovels for their Mesaba range operations.

McCullough & Cheney, Minneapolis, Minnesota, have subbed some railroad work from Foley Bros. on the Seaboard Air Line extension in Florida.

Winston Bros. Co., Minneapolis, Minnesota, were awarded Section F of the work recently let by the Missouri Pacific Railroad Company.

The Minnesota State Highway letting of February 9th was attended by a large number of contractors. Unofficial tabulations would indicate that C. F. Scully, St. Paul, and Thornton Bros., also of St. Paul, were low on paving.

T. M. White, who is doing the excavating for the New Wacker drive, has two steam shovels working on this job.

Conrad Ottenhoff has got a nice contract at Howard Avenue and Kedzie. He has a Class-14 Bucyrus on this work.

Marblehead Lime Company, 160 North La Salle Street, states they will have their 20-B electric shovel operating by March the first. Mr. Everhardt is in charge of this work at 103rd Street and Calumet River.

New England Notes

BY J. W. BISHOP

The hydro-electric development of the Central Maine Power Company on the Androscoggin River near Lewiston, Maine, has been in operation all winter. This project is supervised by the firm of Morton C. Tuttle of Boston, Massachusetts, and although operations are somewhat hampered, due to exceptionally deep snow, very good progress is being made.

Sanders Engineering Company, 102 Exchange Street, Portland, Maine, were recently awarded a contract for an extensive hydro-electric development near Montpelier, Vermont. We understand three low bidders were within 1 per cent, and considering the extent of the total contract which will run upwards to $1,000,000, both Mr. Sanders and Mr. Pierce should be congratulated on their close figuring. The above gentlemen, both able engineers, president and treasurer of the firm of Sanders Engineering Company, have been successful in completing some very difficult work in the Eastern States. Work has already begun on their Vermont contract and we wish them success.

Pacific Coast Notes

BY P. H. BIRCKHEAD

The machine illustrated above is a Bucyrus 50-B loading rock on the Weed Cut-off on the Southern Pacific Railroad. L. R. Wattis Construction Company is doing the job, and the shovel, under the skillful hands of Jack Pendergast, ably assisted by Bob Pfeiffer, stretching the hemp, and Geo. Brayer making the smoke, is averaging 400 4-yard cars in eight hours. Chas. Gulcher is superintendent on the job.

Contract awarded to Lee Moor Contracting Co., Two Republics Building, El Paso, Texas and Tucson, Arizona, who bid $292,167 for construction of steel and concrete Gillespie Dam Bridge. For bids submitted and quantities of work involved, refer to our issue of January 21st.

Contract awarded as follows by United States Engineer's Office, 85 Second Street, San Francisco, for dredging at Rio Vista, Solano County: To Longview Dredging & Construction Co., Longview, Washington, bid of $.069 per yard for 10,000,000 yards dredging in Sacramento River.

Pennsylvania Notes

BY T. H. BARRETT

Michael J. Walsh is running a shovel for Morrissey in Philadelphia.

James McGraw Company of Philadelphia have been awarded the bridge contract to cross the Susquehanna River at Harrisburg, Pennsylvania. They expect to move one of their Bucyrus 20-B's over from Port Clinton for excavating and crane service.

Chas. Strouse of Ashland has sold his interest in the Rhoads Contracting Company and is now living at Atlantic City. The new president of the Rhoads Contracting Company is David Randall, division superintendent of the Susquehanna Collieries Co. at Shamokin. They expect to resume stripping operations at five locations as soon as the anthracite suspension is ended.

The State Highway Commissioners are awarding considerable road jobs in which slag has been bid for the aggregate mix. From the bids submitted so far the cost has apparently been reduced 4 to 10 per cent, but sufficient figures are not as yet available to make accurate findings.

Pittsburgh Items

BY GEO. O. RAGNER

The T. J. Foley Company of Pittsburgh will shortly complete their Allison Park grade elimination excavation for the Baltimore & Ohio Railroad. Mr. Foley is using a Bucyrus 30-B shovel on this work, and a Buhl portable air compressor is furnishing the air for the drills. Considerable rock has been found on this job, but the above equipment is making great headway, and this company anticipates completing this work in another thirty days.

The John F. Casey Company have recently been awarded the Glenfield grade elimination work for the Pennsylvania Railroad Company, and are now moving in the equipment for this new construction. The John F. Casey Company have also been awarded some tunnel and excavation work by the Montour Railroad Company and expect to use their Bucyrus 50-B shovel on this new work. This shovel was purchased for the Canton-Bayard-Pennsylvania Railroad work which they have just completed.

The Beck, Riley & Hall Equipment Co., are busily engaged overhauling steam shovels, cranes, locomotives, dump cars, and other equipment at their Neville Island Shops preparatory to sending them out for the coming construction season. Mr. John G. Beck, formerly of the Bucyrus Company and the Western Wheeled Scraper Company, is president of this concern, and reports being well pleased with the prospects for business in his line during 1926.

This machine is a Bucyrus 70-C being operated by Boggess & Steele, contractor of Ashland, Kentucky, some seven miles west of Chillicothe, Ohio. The machine is in gravel upon the Norfolk & Western Railroad.

Mr. W. M. Crantz writes that it will probably be a three-year job. The machine is operated by W. M. Crantz, engineer, C. W. Mays, craneman, and W. E. Crantz, fireman.

"*Yes, It's* All Bucket!"

No counterweights on any WILLIAMS. The weight is all built right into the bucket, where it adds strength as well as digging power.

That's why you see WILLIAMS Buckets all over the country giving good service today, after 15 years or more of hard work. As another owner writes:

"After handling crushed rock and dredging gravel since 1909, our WILLIAMS is still at work and has had only minor repairs." (Name on request.)

Built so well that it is guaranteed against breakage.

Tell us your bucket requirements. There is a WILLIAMS that will give you the output you need — on excavating or rehandling. And continue to do it for years. Because every WILLIAMS is ALL BUCKET!

G. H. WILLIAMS COMPANY, 603 Haybarger Lane, Erie, Pa.
Eastern Sales Office: 30 Church Street, New York City

WILLIAMS
FAST-DIGGING BUCKETS
All Parts Guaranteed Against Breakage

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In Florida reclamation work *the* F-M Diesel *again proves its case*

Unfailing economy and dependability, the things on which an engine is judged in dredge or dragline service, prove the F-M Diesel engine the ideal power unit for excavating operations. On the Monighan dragline ditcher shown above, used by the Canal Construction Co., Melbourne, Fla., the F-M Diesel, burning low-grade fuel oils, is providing thoroughly dependable power at lowest cost.

FAIRBANKS, MORSE & CO., Chicago

Manufacturers of Oil Engines, Pumps and Electrical Machinery

28 branches in principal cities at your service.

FAIRBANKS-MORSE

DIESEL ENGINES · MOTORS · PUMPS

1648

For convenience in making inquiry use postal inserted in this number.

John F. Casey's Bucyrus 50-B on the Canton Cut-off is making an average of 36,000 yards — single shift.

Mr. Chabot, General Superintendent of John F. Casey Company, was a visitor at our office last Friday, January 22nd.

R. M. Netherland Company have been awarded a contract for the Ward Baking Company Building. Their Bucyrus 20-B is doing the excavation.

The Clinton Iron & Steel Company of Pittsburgh, Pennsylvania, have their new Bucyrus 30-B electric about ready for operation.

Booth & Flynn were awarded a contract for the 10th Street Bridge.

Gene Bucannally, one of Charleroi's prosperous contractors, was a visitor at our plant in South Milwaukee.

Thomas Kemp, shovel runner, came into our office from Canada. He has just finished working on a Bucyrus 103-C Electric.

Southern States Notes

BY W. W. WHORLEY

The Phoenix Portland Cement Company expect to begin construction work shortly on a new cement plant at Powderly, Alabama. This plan will cost about $2,500,000, and will have an annual capacity of 1,300,000 barrels of cement. The construction of this plant will add to the prestige of Birmingham as a cement producer, as it will be the fifth plant in this district.

St. Louis Items

BY A. B. KOENIG

H. W. Nelson of the H .W. Nelson Co., Chicago, was here bidding on the new Missouri Pacific Railroad double-track work. Mr. Nelson reports their various contracts getting along nicely.

The Pennsylvania Railroad Co. filed a petition with the Illinois Commerce Commission for permission to construct an additional track and siding between the cities of Altamont, Effingham County, and Brownstown, Fayette County, Illinois.

Norman Davis of Sikeston, Missouri, was awarded the contract for building the highway from Holcomb, Missouri, west three miles to the Brown's Ferry Bridge on the St. Francis River.

J. W. McMurry of the J. W. McMurry Contracting Co., Kansas City, was with us a day. Nothing new this trip.

W. P. Laster & Son are graveling the Harrisburg and Marked Tree Road from Long Pond to Winona, Arkansas, about 5 miles.

The Southern Material & Construction Co. of Little Rock was awarded the contract to build the Osceola-Little River Road, Arkansas. Their bid was $770,000.

P. J. Murphy, Moberly, Missouri, has his outfit resting up for the winter.

Orin Stewart Co. are grading school grounds in Alton, Illinois.

Pouring of concrete on the two-way highway bridge over Frog Bayou on the new state highway between Van Buren and Alma, Arkansas, has been started. The bridge is being erected by the Luton Bridge Co. at an approximate cost of $30,000.

TAYLOR MESABA

STEAM SHOVEL CHAIN IS CONSTANTLY WINNING AND HOLDING GOOD WILL

Actual yardage records kept by hundreds of quarries, mines and contractors conclusively prove that while the first cost of Taylor-Mesaba Chain may be a trifle higher over a period of time it is by far the cheapest.

"BEST BY TEST"

S. G. Taylor Chain Co.

(Established 1873)

641 Marquette Building

CHICAGO, ILL.

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MAKERS OF POWDERS SINCE 1802

The oldest du Pont powder mill—built in 1802

Leadership

Leadership is measured by service.

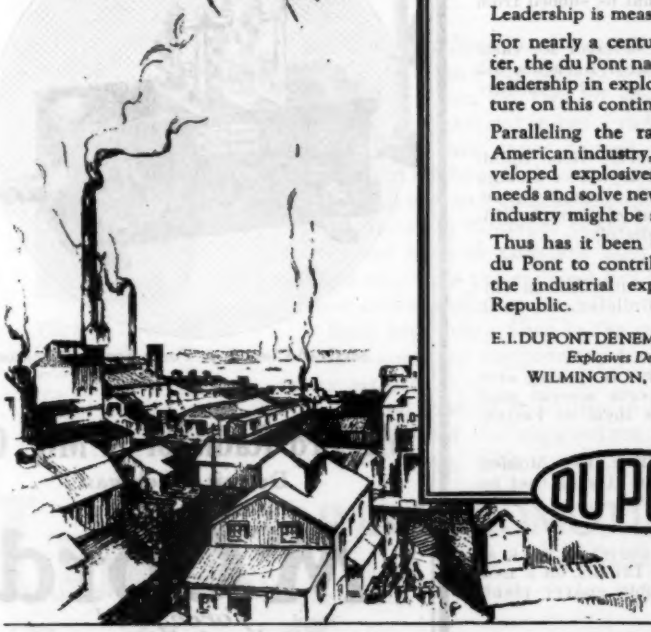
For nearly a century and a quarter, the du Pont name has signified leadership in explosives manufacture on this continent.

Paralleling the rapid growth of American industry, du Pont has developed explosives to meet new needs and solve new problems that industry might be served.

Thus has it been the privilege of du Pont to contribute a share in the industrial expansion of the Republic.

E. I. DU PONT DE NEMOURS & CO., Inc.
Explosives Department
WILMINGTON, DELAWARE

DU PONT



Partial view of Repauno Plant, one of the largest explosives plants of the du Pont Company.

129 YEARS OF LEADERSHIP IN THE SERVICE OF INDUSTRY

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J. P. Sparks, Kirkwood, Missouri, wants an elevating grader and ¾-yard shovel on state highway work in Wayne County, Missouri.

Reid & Lower are busy on the Florida East Coast Railway in Southern Florida.

Columbus S. Jones, the Boss Station Man, returned from a trip over the Kansas, Oklahoma and Gulf Railroad in Oklahoma where he has contract for bank widening.

H. K. Rhoades was awarded contract for paving in Lincoln, Illinois.

The Dominion Construction Co. started track laying on the Edgewood Cut-off of the Illinois Central Railroad.

Luther S. Oakes, president of the Winston Bros. Co., Minneapolis, whom we reported ill in last issue, has recovered. Mr. Oakes passed through St. Louis with Mrs. Oakes the other day on their way to Beloxi, Mississippi, to spend a few weeks in the sunny South and balmy air.

Sprague & Nicely, who bid with the List Construction Co. on the Missouri Pacific double-track work, are placing one outfit at Washington and another at Dundee, Missouri.

Keating Bros. are grading property near Clayton, Missouri, and looking for work for a machine outfit. Box 25, Clayton, Missouri, will catch them.

Ora Hamer placed his outfit on a piece of state highway work near Potosi, Missouri, that he subbed from C. P. O'Reilly.

Contractors when in want of work or labor for their outfits get in touch with the Koenig Labor Agencies, 612 Walnut Street, St. Louis, Missouri, or 501 Delaware Street, Kansas City, Missouri.

Jim Dougherty of Morris & Dougherty, Globe Building, St. Paul, Minnesota, spent several days here looking over the Missouri Pacific Railroad work. Dougherty reports a dozen steam shovels idle, most of them in Illinois, that he can place on work immediately.

Maloy & Fowler have a small car outfit idle in Illinois, and want work for it. Globe Building, St. Paul, Minnesota, is their headquarters.

Tom Blythe of Shugart & Blythe was in looking over the Missouri Pacific work. Tom reports several good team outfits idle in Illinois. Address them at Farina, Illinois.

C. C. Barnes, 313 Equitable Building, Des Moines, Iowa, has three machine outfits idle in Illinois that he would like to place on work immediately.

John (Tight Line) Kinney has a shovel at work at Columbia and a team outfit at Phelps, Illinois, on a new Missouri Pacific spur into the Columbia quarry plant.

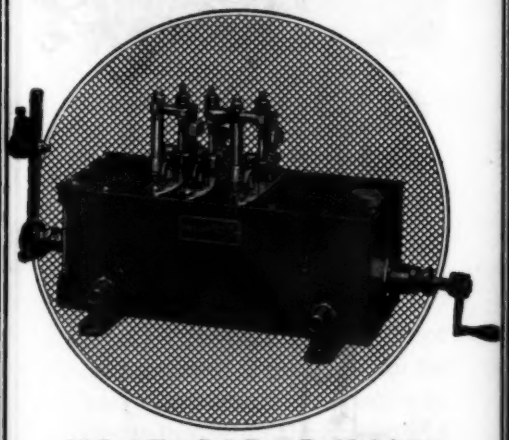
Joe Murphy is working two machine outfits, Wm. Brothers one machine outfit and J. T. Maloney a machine outfit on Cameron, Joyce & Company's grading in the southwestern part of the city.

A McCord Force Feed Lubricator Will Keep Your Shovel on the Job

A McCord force feed lubricator installed on your steam shovel now will insure more continuous operation. Dependable force feed lubrication prevents shutdowns and delays, it gives more hours on the job.

McCord force feed lubricators are used as standard equipment by the largest and best-known steam shovel builders and they will be installed on any shovel at your request.

Put a McCord lubricator on now and be assured of dependable lubrication for the life of your shovel.



McCord Class B. A. Force Feed Lubricator

McCord Radiator & Mfg. Co.
Detroit, Michigan

McCord
force feed
Lubricators

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"Our Shay Has Been in Constant Operation"

The Shay Industrial Catalog will tell you what Shays are doing under conditions similar to yours. Write for a copy.

ALL the hauling for a western company is handled by a 20-ton Shay Geared Locomotive. Conditions compel operation on two to seven per cent grades, while the sharpest curve has a radius of 146 feet.

"Our Shay has never caused delay on account of breakdown, although the locomotive has been subject to very heavy and continuous duty," is the statement of the Assistant Manager of the Company.

"It has been in constant operation for two years, and in that time the railroad has more than repaid the entire investment."

Built into every Shay is the ruggedness needed for stone haulage — ruggedness for continuous, heavy-duty service.

If you'll send us an outline of your conditions, we'll be glad to offer our suggestions for the improvement of your hauling, with sturdy, efficient Shays.

LIMA LOCOMOTIVE WORKS

Incorporated

Lima, Ohio — 17 East 42nd St., New York

LIMA *Shay Geared* **LOCOMOTIVES**

Canada

Montreal and Vicinity

BY J. M. WARD

Fraser-Brace Company have taken a large contract at Chelsea, Province of Quebec, for the Canadian International Paper Company. They have quite a large plant at work there and have recently purchased two 4-ton and one 8-ton Vulcan gasoline locomotive for use on this job.

Joseph Blais has secured contract from the Quebec Provincial Highways Department for supplying fine crushed stone for top dressing. This will keep his quarry busy some time, and he has recently added a new 18-inch Symons Disc Crusher to his equipment.

Jim Smith, formerly well known on the Transcontinental Railway Construction, has lately affiliated himself with the Foundation Company on the new Gatineau Dam at Maniwaki, Province of Quebec.

A very busy season is expected in the City of Quebec with the construction of new docks, as well as the two large pulp mills and a heavy paving program by the City.

Wm. Cook, contractor of North Sydney, also of the firm of Cavicchi & Cook, was a recent visitor in Montreal.

The Atlas Construction Company have recently purchased a 7-ton Vulcan gasoline locomotive to be sent up to their job on the Welland Canal.

Gorman & Peckham are busy on a 60,000-yard rock excavation job for the Quebec Development Company at Isle Maligne, Province of Quebec. They are also building some further railway line for the Aluminum Company at Chute a Caron.

Toronto and Vicinity

BY C. F. ENGLAND

Morrow and Beatty Limited of Peterborough have a contract for some sixty miles of railroad in Northern Ontario. This is in connection with some large pulp and paper undertaking in that district.

The City of Toronto have recently called tenders on some sewer work in North Toronto. This is part of the new sewer scheme which has been discussed for some time for that district.

Among the many conventions held in Toronto during January were The Canadian Association of Building Industries; The Engineering Institute of Canada; and the Canadian National Clay Products Association. These different conventions brought to the city contractors, engineers and manufacturers from all parts of Canada.

If predictions are right Toronto should see quite a lot of construction work this year. It is estimated that there will be some seventy million dollars spent in building and construction work in this immediate vicinity.

TRADE NOTES

The Cleveland Tractor Company, Cleveland, Ohio, has prepared an attractive 1926 Cletrac calendar, with some interesting illustrations of their tractors and showing their various performances. A copy of this calendar may be obtained upon writing the manufacturer at the above address.

10-TON CRANE
BUILT BY
OHIO LOCOMOTIVE CRANE CO.
Bucyrus, Ohio

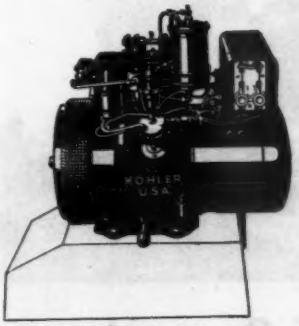
Nationally recognized as builders of the HIGHEST QUALITY PRODUCT.

Would they consider using anything but the best quality of boiler?

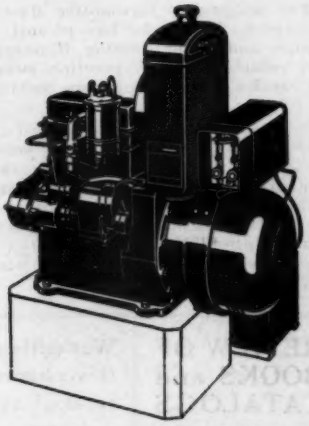
JOHNSTON BROS., Inc.
Specializing in Boilers for Contractors' Equipment
FERRYSBURG, MICHIGAN

KOHLER Electric Plants Enable You To

Double the Yardage Per Day



Kohler Automatic Electric Plant
Model "S"—800 Watts



Kohler Automatic Electric Plant
Model "D"—1500 Watts

Your equipment can be kept at work all through the night if your jobs are lighted up with electric light from a Kohler Electric Plant.

Night work will double the output per machine. It means lower overhead costs per job. More jobs per machine per season. Better service. And it means meeting completion dates on time.

The Kohler Plant is suited for the work. It is *compact* and *powerful* — more electricity for its size than with any other plant.

It is *sturdy* — all moving parts are oversize.

It is *dependable* — the United States Air Mail Route from New York City to Cleveland, Ohio, is lighted by them nightly.

Thousands of Kohler Electric Plants are used on farms, in resorts, and aboard ships as well as on construction and excavating units.

Write for the booklet giving specifications.

KOHLER OF KOHLER

KOHLER CO., *Founded 1873*, KOHLER, Wis.
Shipping Point, Sheboygan, Wis.
Branches in Principal Cities.

For convenience in making inquiry use postal inserted in this number.

The Hayward Company, 50 Church Street, New York City, has just issued a bulletin, No. 626, illustrating and describing the use of Hayward buckets for sewer, road and street work, and a 4-page pamphlet, No. 657, containing information on the Hayward Dwarf orange-peel buckets. These bulletins may be obtained upon writing the manufacturer.

The Milwaukee Locomotive Manufacturing Company, Milwaukee, Wisconsin, has recently issued an 8 x 10½, 24-page and cover catalog illustrating and describing their complete line of gasoline locomotives. A copy of this catalog may be had upon writing the manufacturer.

A booklet has just been issued by the *Page Steel & Wire Company, Bridgeport, Connecticut*, in which standard specifications for woven wire fabric guard are enumerated. The booklet was prepared after a full review of the specifications that already had been adopted by many of the states, and it includes many suggestions from various state highway departments. A copy of this booklet can be obtained upon application to the above company.

REVIEW OF BOOKS and CATALOGS

We shall be glad to review, in this column, such books and catalogs as are sent to us.

ELECTRIC HEAT IN INDUSTRY — 8 x 10½, 32 pages and cover. Illustrates and describes the advantages of electric heat for various industrial applications. A copy of this bulletin No. GEA-261 may be had upon application to the *General Electric Co., Schenectady, N. Y.*

Protect Yourself — DEMAND

ALBANY GREASE

THE 100% *Lubricant* NEVER DRIPS

YOU can always rely on the Quality of Albany Grease. It hasn't varied in 58 years — not just grease, but a highly developed lubricating grease for all kinds of excavating machinery. Sold in cans and barrels — all consistencies.

Always look for the Albany Grease Trade Mark — Refuse Substitutes.

Your dealer can supply you. If not, write us.

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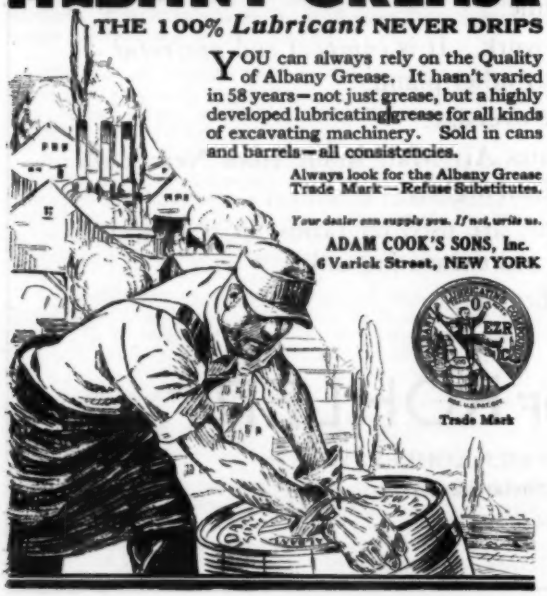
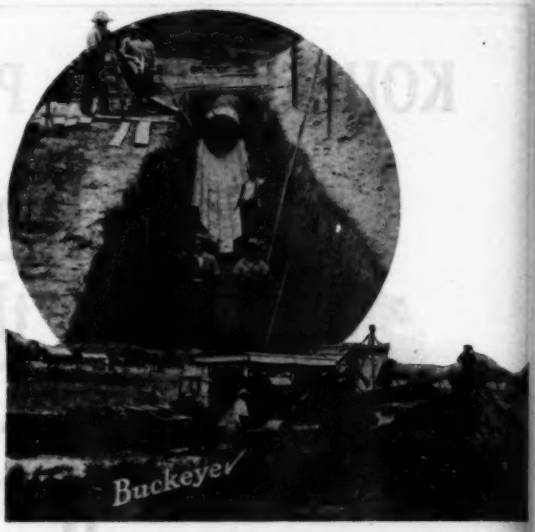


Trade Mark



"Cost of Operation and Upkeep Far Below That of Others"

"Our Buckeye has given us such splendid service that it would not be possible for us to make a kick", write Ernest Lorenz & Son, Roseville, Michigan.

"It is a better machine mechanically, less complicated, and the cost of operation and upkeep is far below that of other machines we have had."

After operating this Buckeye nearly two years, these owners give us these facts based on actual experience.

Would *you* be so enthusiastic about *your* trench excavator?

Why not find out *why* so many Buckeye owners are Buckeye boosters? There's a reason — just ask any Buckeye *user*, or send for the Buckeye booklets.

The Buckeye Traction Ditcher Company
Findlay, Ohio

Manufacturers of Trench Excavators (both Wheel and Chain-and-Bucket Types), Pipe-Line Trench Excavators, Tile and Open Ditchers, Back-Fillers, Pipe Screwing Machines, Curb Diggers and Clay Diggers.

THERE'S A BUCKEYE SALES AND SERVICE OFFICE NEAR YOU

BUILDERS OF TRENCH EXCAVATORS FOR OVER 30 YEARS

Loading a train of WESTERN 12-yard dump cars at the borrow pit on Chesapeake & Ohio Northern work. These contractors made every 12-yard car carry 16 cubic yards of material.

Making Money for the Contractors

WESTERN dump cars never will forget that their sole duty is to *move dirt* and keep your costly shovel digging. The best shovel in the world cannot make a dollar for you except when it is digging.

By sticking to the track, by keeping out of the repair shop, by speed in dumping, by ability to carry huge loads and to stand grief, WESTERN dump cars have helped many a shovel to dig out a fortune for the contractor.

Let's get the preliminaries out of the way now for early delivery.

Write today.

Western

That's Why!

Western Wheeled Scraper Co.

Founded 1877

Earth and Stone Handling Equipment

Aurora, Illinois

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GRASSELLI R-B SILICATE OF SODA FOR CURING AND HARDENING CONCRETE ROADS—A 5½ x 7½, eighteen-page booklet, illustrated. Contains valuable information regarding tests made by several highways and public roads departments, and a careful survey of over 100 miles of concrete road laid during the past five years and cured with silicate of soda. A copy of this booklet may be obtained upon writing *The Grasselli Chemical Co., Cleveland, Ohio.*

BLASTERS' HANDBOOK—4 x 7, 100 pages and cover, illustrated. A brief description of du Pont explosives and blasting accessories, and a full exposition of practical blasting methods in all the major operations where explosives are employed. This handbook may be obtained upon writing the *E. I. du Pont de Nemours & Co., Wilmington, Delaware.*

THERE is an interesting story connected with the design and working parts of Madison-Kipp Lubricators. We believe any operator or engine mechanic would find this story instructive as well as interesting.

We have prepared a bulletin which describes the inside mechanism of Madison-Kipp Lubricators which we will send to anyone requesting it.

May we mail one to you? Ask for Bulletin No. 50.

Madison-Kipp Corporation

Madison, Wisconsin, U.S.A.

TWIN CITY ENGINES

Northwest Crane in work on a Western Water project. Equipped with a TWIN CITY ENGINE.

Other Twin City users include:

Austin Machinery Corp., Baldwin Locomotive Works, Buckeye Traction Ditcher Co., Bucyrus Co., The Parsons Co., Washington Iron Works, The Harnischfeger Corp., Inland Engineering Co., Pennsylvania Pump & Compressor Co., Star Drilling Machine Co., Willamette Iron & Steel Works, etc. Specify Twin City Engines on your equipment. Sizes 35 to 140 H. P. Write for literature.

Minneapolis Steel & Machinery Company

Minneapolis, Minn.

Heavy Duty Engine Manufacturers Since 1903

"BUILT TO DO THE WORK"

A Drill for Bad Moving

A BIG blast hole drill on coal stripping work or construction jobs will often encounter bad moving conditions in early spring and late autumn. A traction blast hole drill equipped with "Apron Wheels" (continuous treads) as illustrated here is a big advantage at these times.

You contractors who handle rock jobs can use a copy of our 120-page book "Big Blast Hole Drills." Half of this book contains data on drilling and blasting rock, with costs. The balance of the book describes in detail Cyclone No. 14 Big Blast Hole Drills, a special development of well drills, designed and built for rock excavation.

Write for "Big Blast Hole Drills."

THE SANDERSON-CYCLONE DRILL COMPANY

Orrville, Ohio

EASTERN AND EXPORT OFFICE
30 CHURCH STREET, NEW YORK

TIMELY SUGGESTION FOR SAVING MONEY on GELATIN

The prevailing market on raw materials makes it again possible to sell Hercules Extra (Ammonia) Gelatin at a lower price than the straight gelatins.

Right now it is wise for every user of Gelatin to consider the use of the Hercules Extra Gelatins. They are equal in strength to the corresponding grades of straight gelatin. The fumes are as good on all grades up to and including 60%, and in higher strengths the Extra Gelatin fumes are better; in other characteristics, extra and straight gelatins are practically equivalent.

There may be some work which can be more effectively done with straight gelatins, but it is exceptional. On most jobs there is no difference in results, but there is a gratifying difference in cost.

This recommendation is made in accordance with our policy to sell every customer the explosive which will do his work best at the lowest cost. If you use gelatin, you may profit by asking us more about Hercules Extra Gelatins.

HERCULES POWDER COMPANY

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DENVER	PITTSBURGH
DULUTH	POTTSVILLE, PA.
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Please have your nearest branch office quote on Hercules Gelatin and Extra Gelatin in ☐ Car load lots ☐ Ton lots ☐ 500 lb. lots ☐ less than 500 lb. lots.

We use explosives for the following-named purposes:_____

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UMI

Stripping thirty to forty-five feet of cover from a lower coal measure brought close to the surface. A Bucyrus 320-B steam shovel, equipped with 6-yard dipper, 85-foot boom and 58-foot dipper handles.

General view of strip pit. The 6-yard shovel in the background is stripping cover; the small shovel in the foreground, a Bucyrus 35-B equipped with a special coal-loading 1¼-yard dipper, is loading No. 6 coal from a seam which averages 54½ inches thick.